

FIG. 1

Quadrature Mach-Zehnder Modulation Device

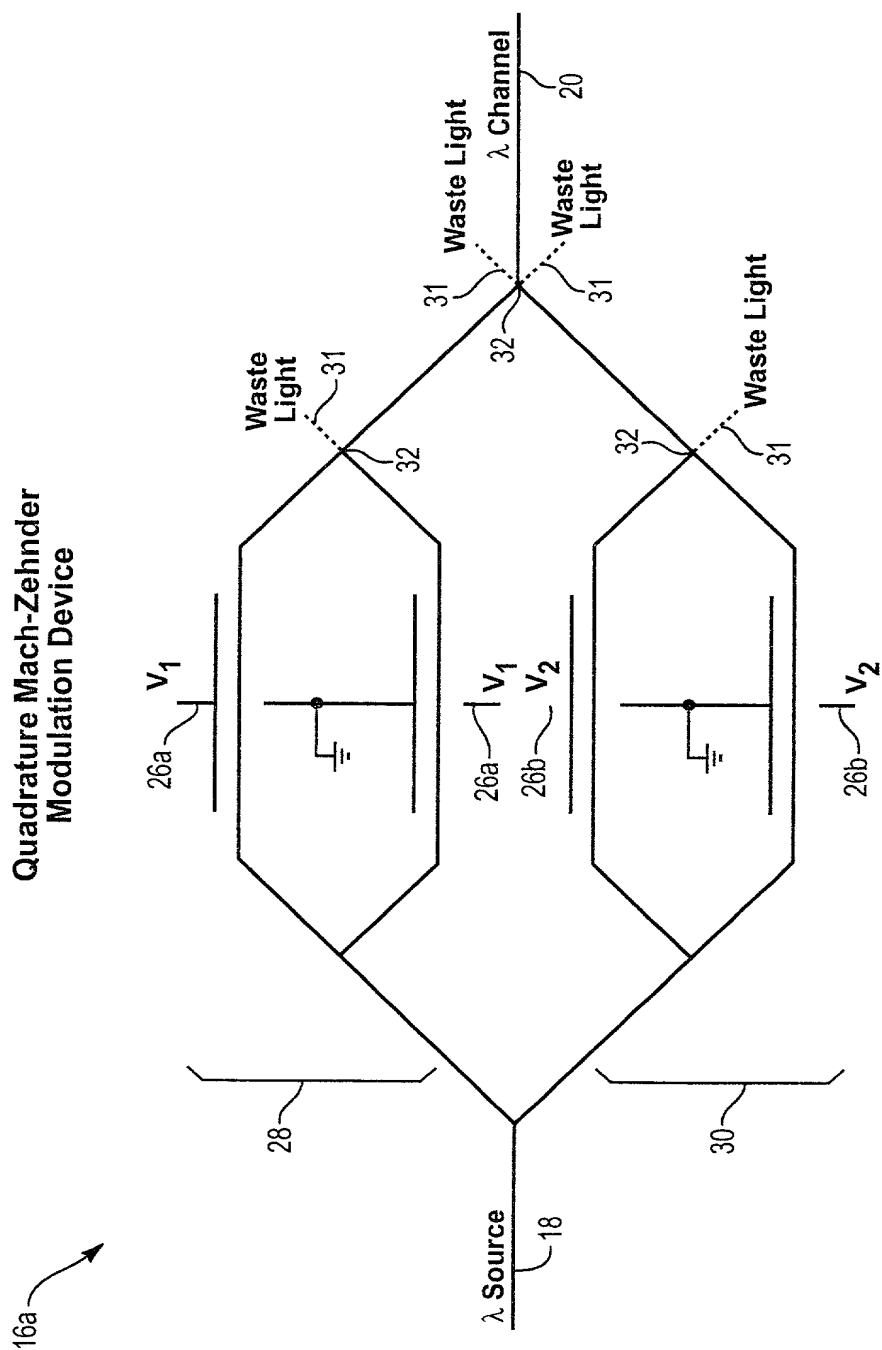


FIG. 2

Mach-Zehnder Device
Transfer Function

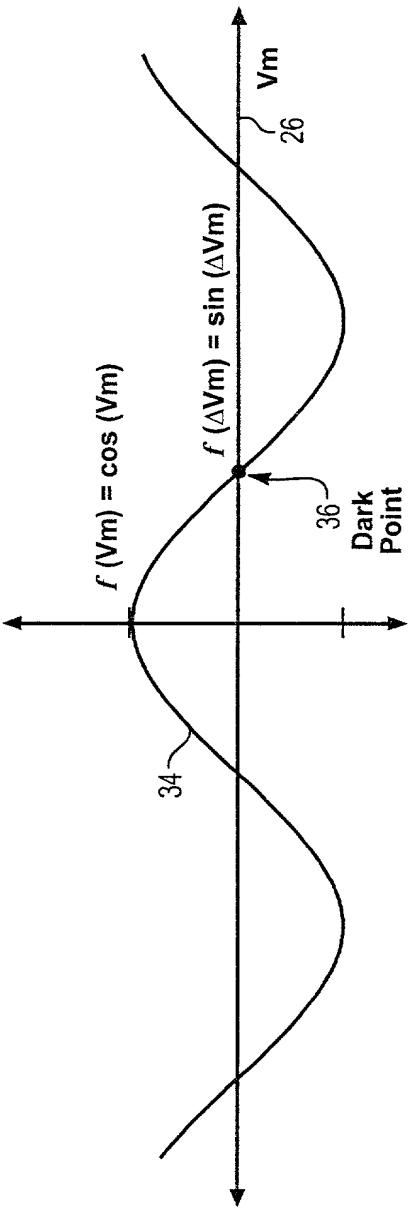


FIG. 3

FIG. 4 is a block diagram of a Modulation Synthesizer 12, which includes an Error input 21, a Shift input 24, an Integrator 38, a Summing Junction 42, and a Waveform Generator 46. The Error input 21 is connected to the Integrator 38, which outputs a signal 40 to the Summing Junction 42. The Shift input 24 is connected to the Summing Junction 42, which also receives a feedback signal from the Waveform Generator 46. The Summing Junction 42 outputs a Total Shift signal 44 to the Waveform Generator 46, which produces the final output 26.

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Modulation Synthesizer

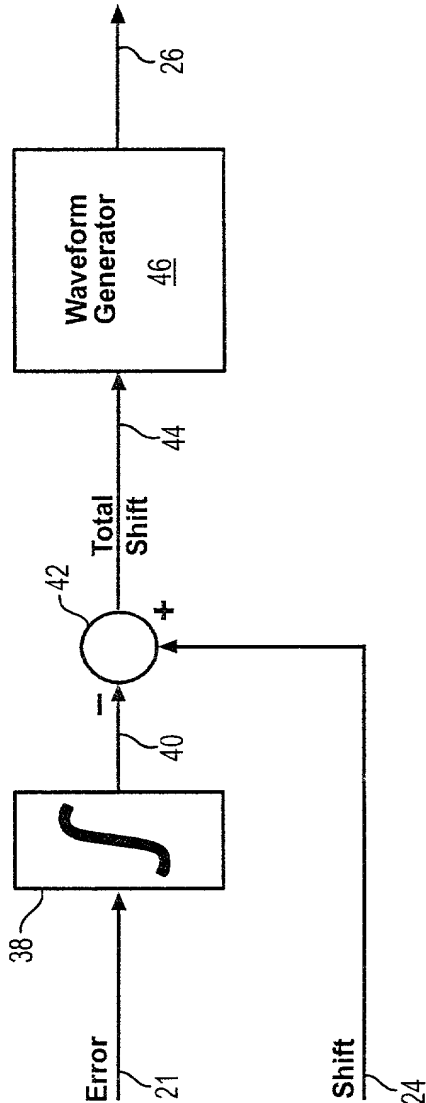


FIG. 4

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Quadrature Modulation Synthesizer (With On/Off Data Keying)

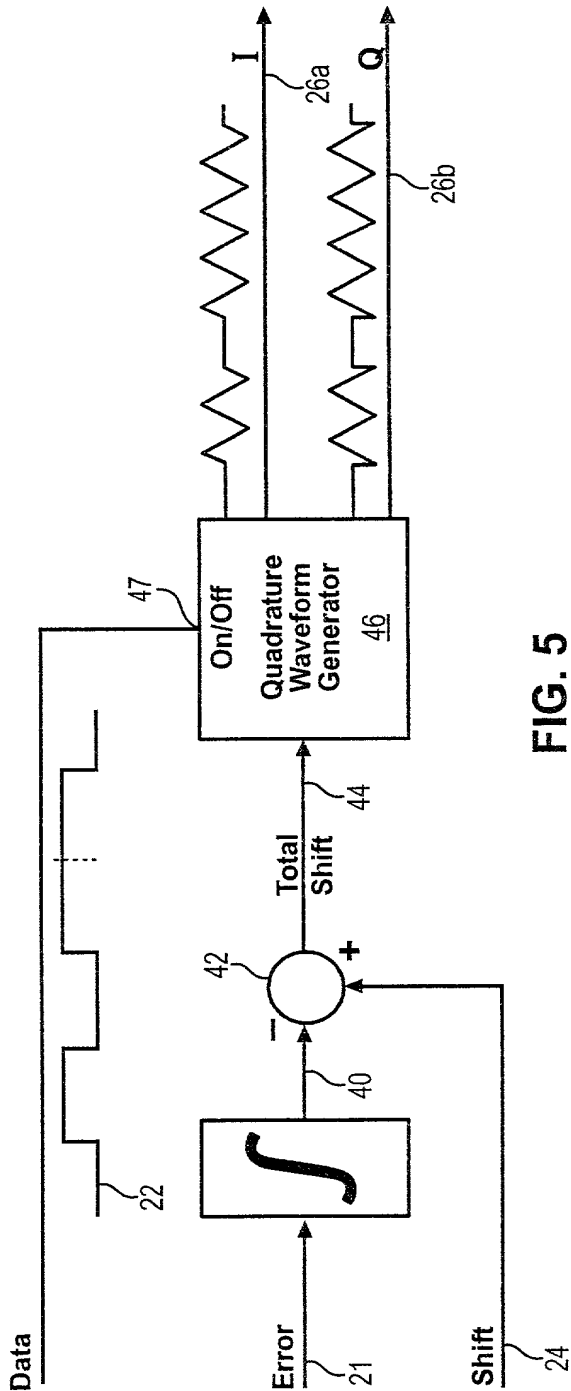


FIG. 5

the first and second phases in the first and second channels, respectively, are

Phase Modulation Device

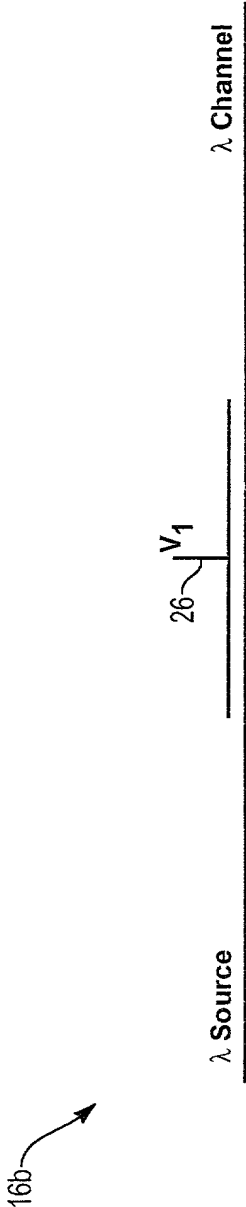


FIG. 6

Modulation Synthesizer (With Frequency Shift Keying)

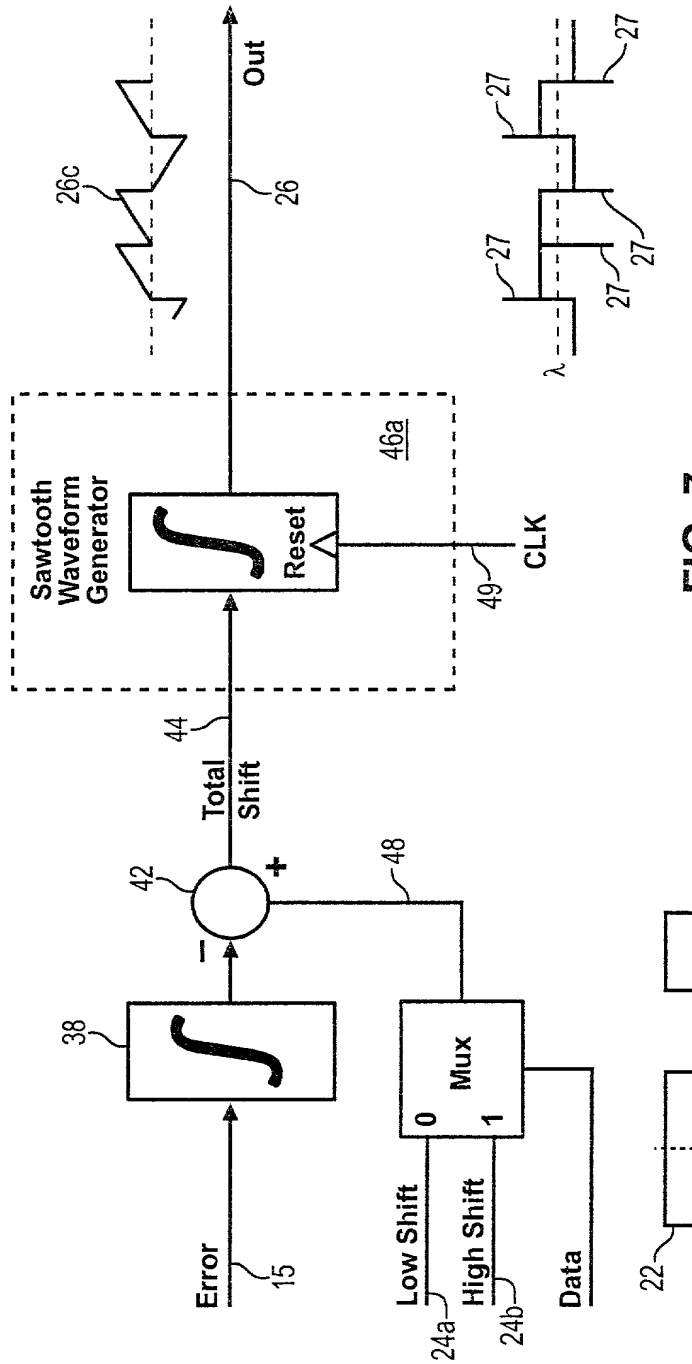


FIG. 7

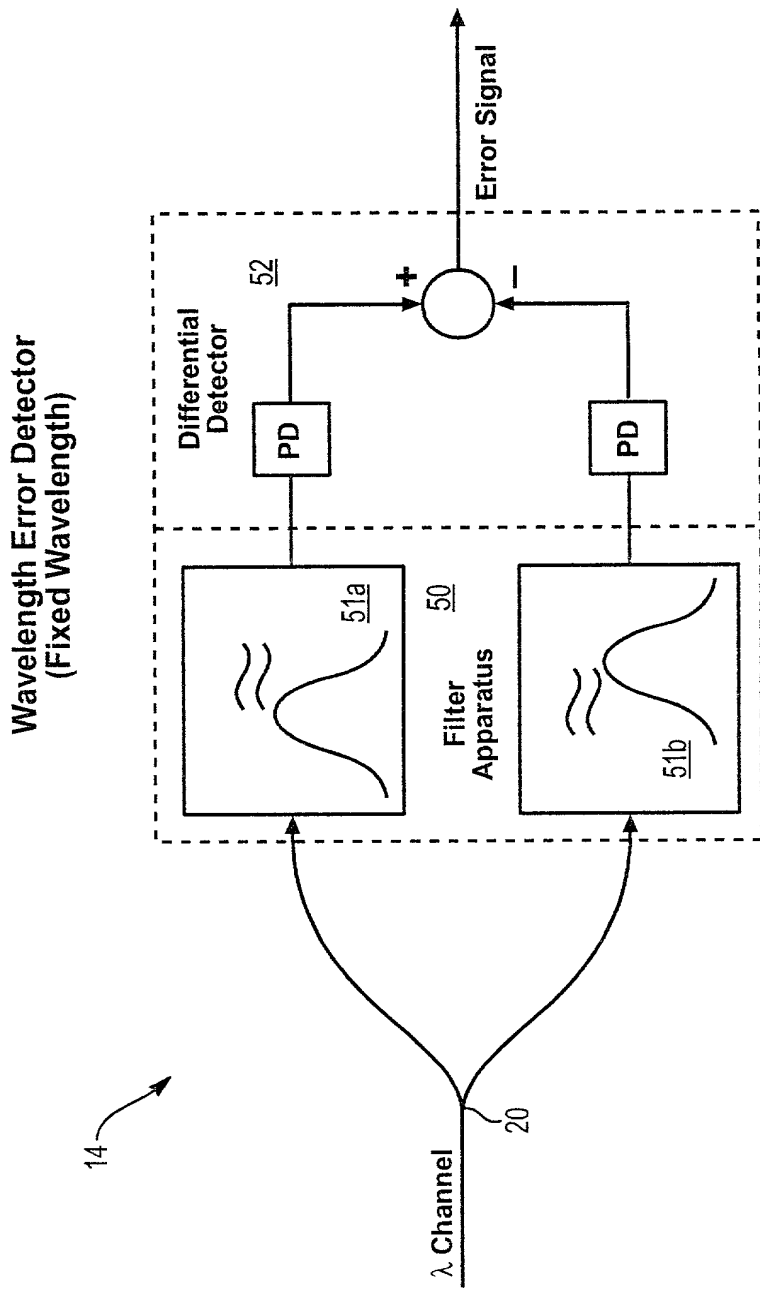


FIG. 8

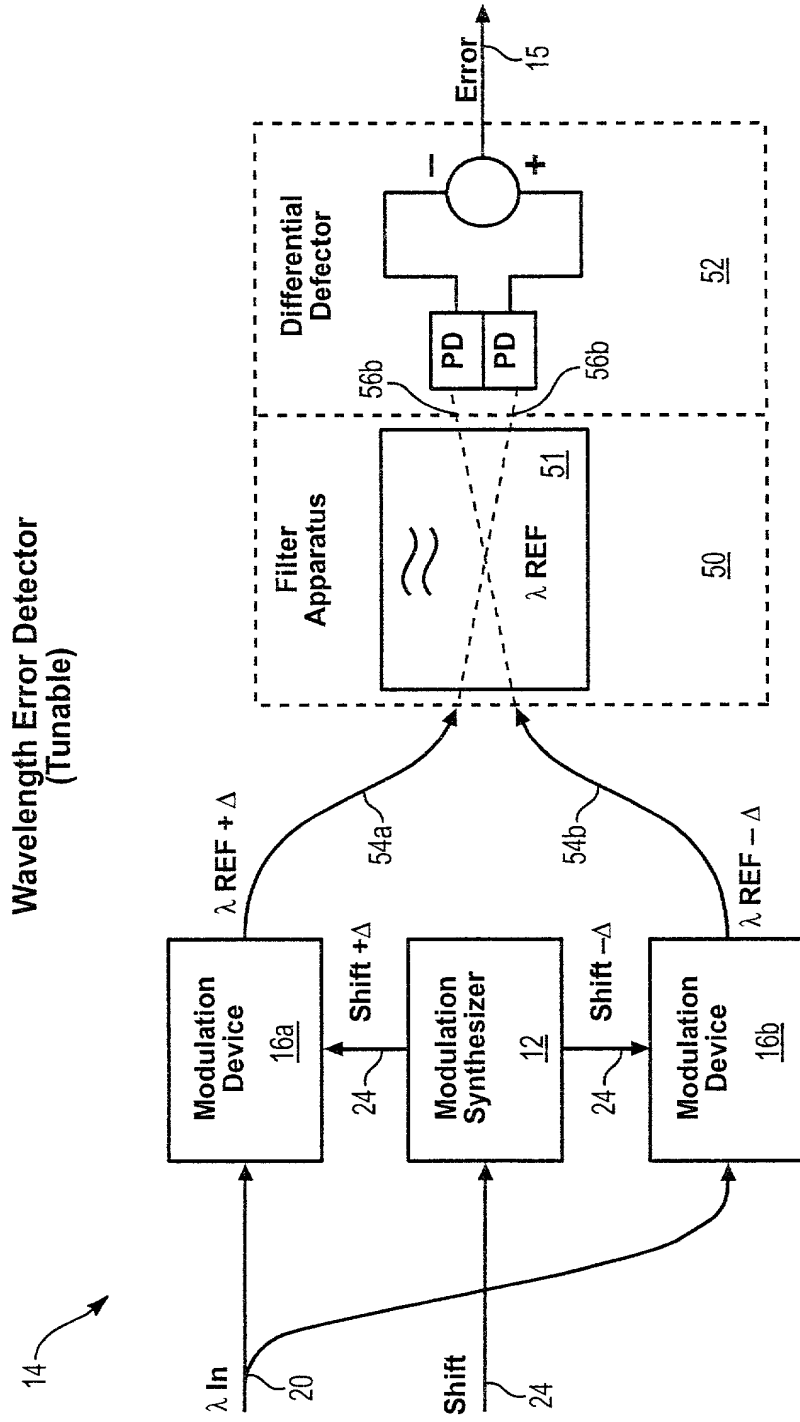


FIG. 9

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Wavelength Error Detector (Tunable)

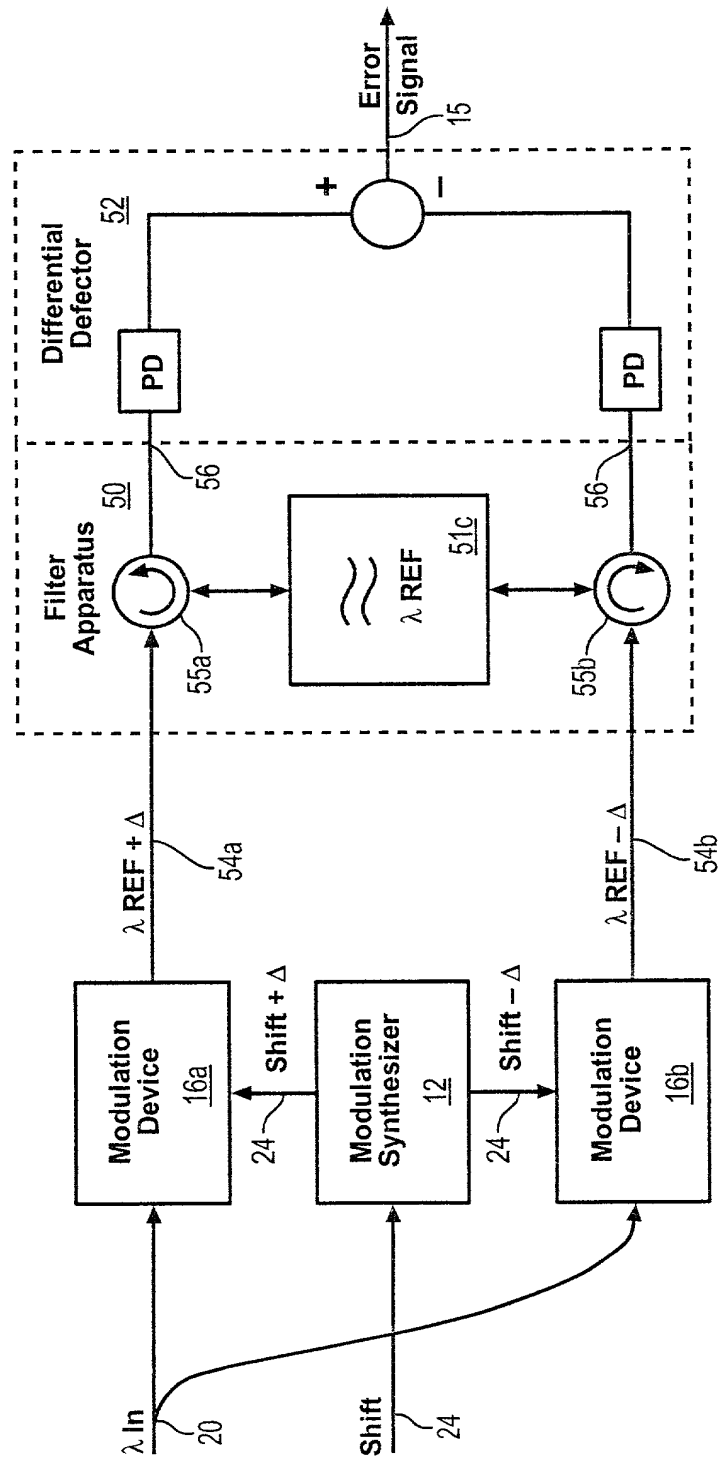


FIG. 10

Channel Allocation Mechanism

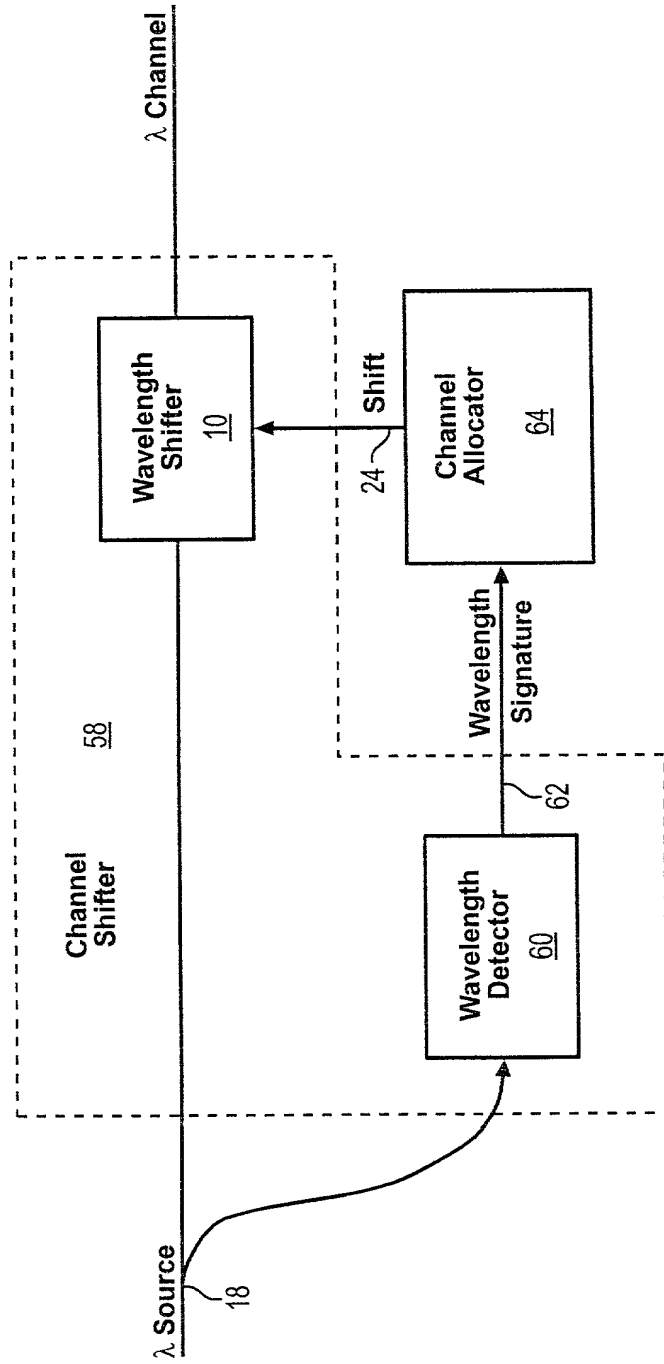


FIG. 11

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Tunable Wavelength Stabilized Transmitter

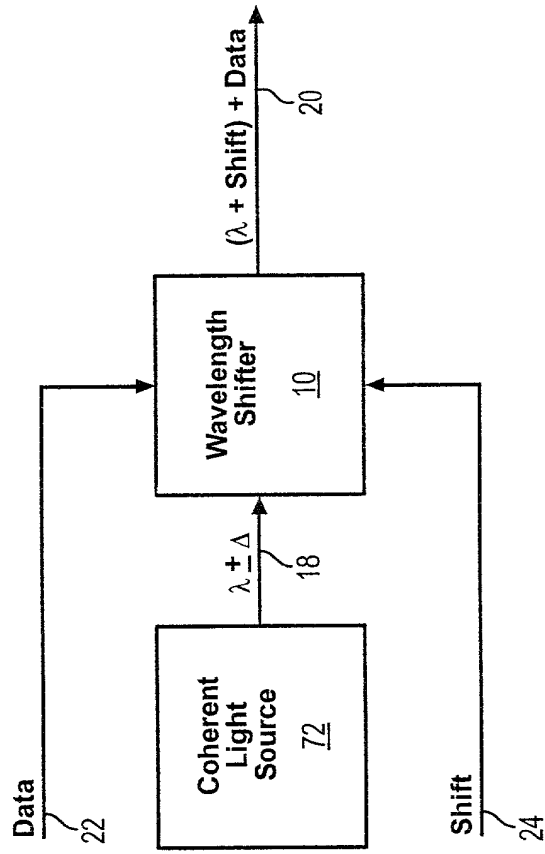


FIG. 12

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Recursive Wavelength Shifter

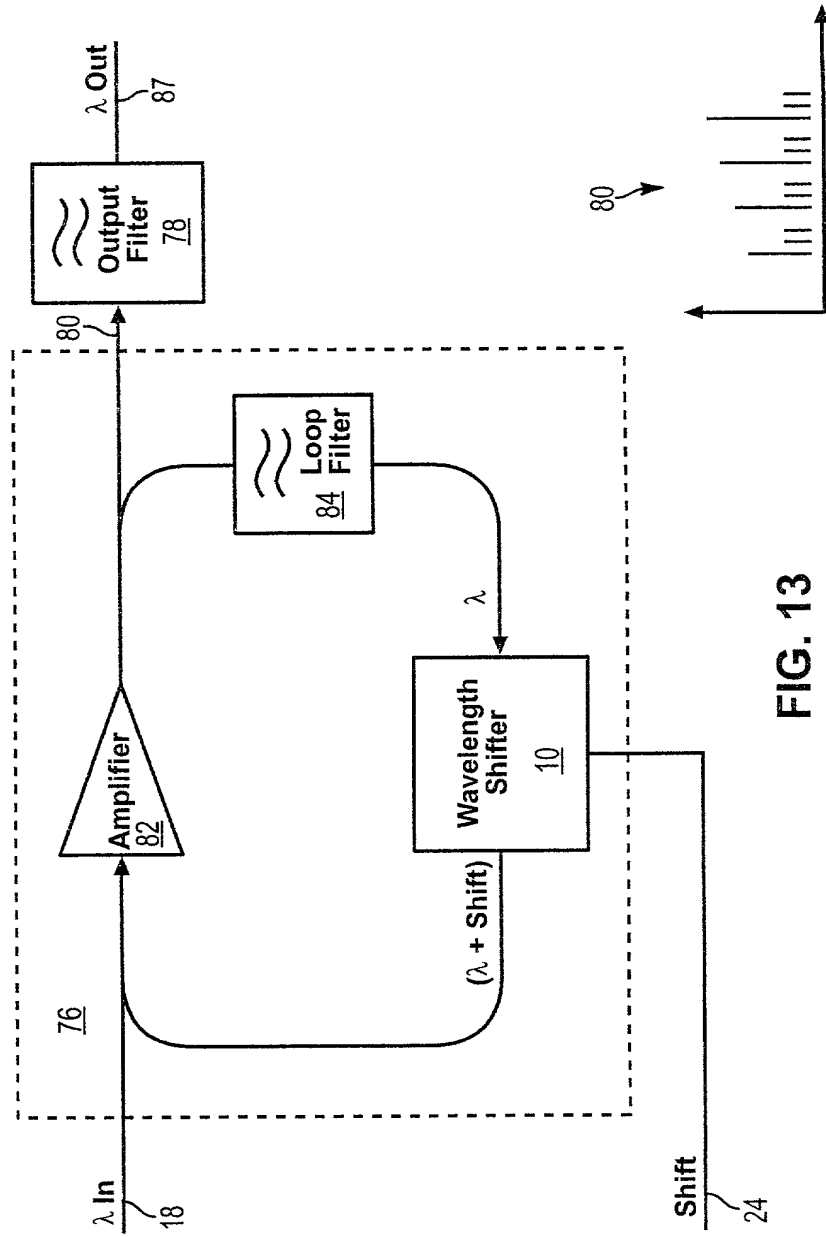


FIG. 13

where ω_0 is the natural frequency of the system, ω_c is the critical frequency, and ω_d is the damped natural frequency.

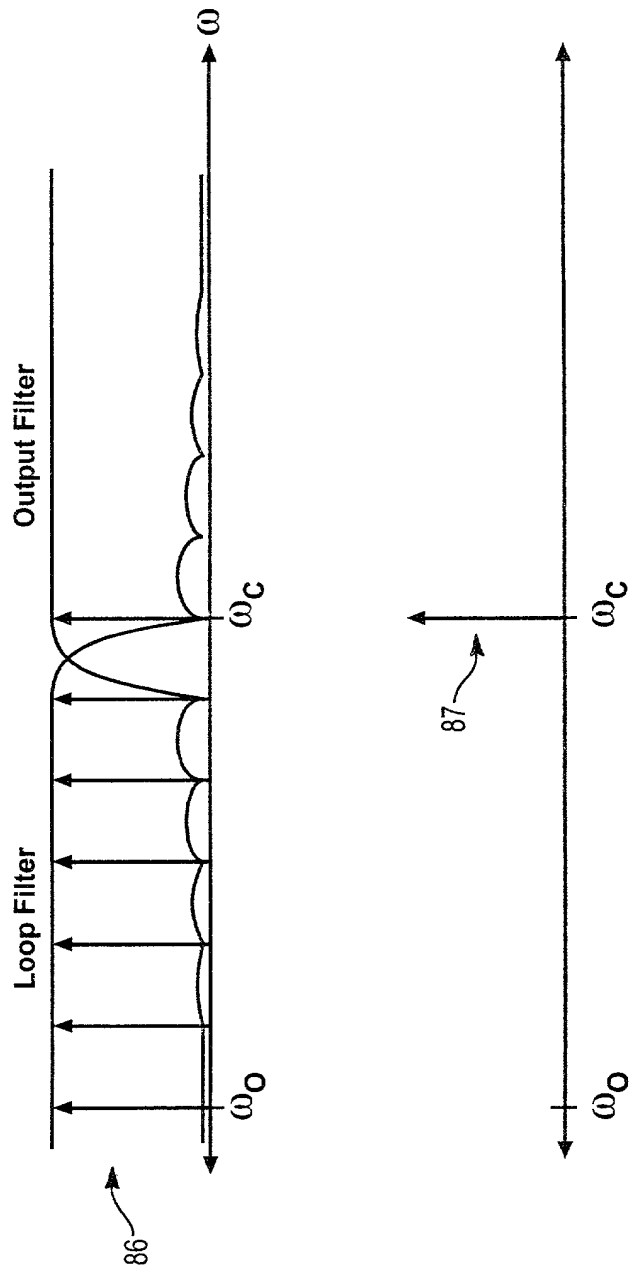


FIG. 14